I CLAIM:

1. A communication system comprising: a first bridge, and a second bridge serially connected to the first bridge, to provide a serial communication interface between a first device layer such as an asynchronous transfer mode (ATM) layer and a second device layer such as a physical (PHY) layer; the first bridge being connected according to an established protocol to the first device layer, the first bridge being transparent to the first device layer and programed to represent the second device layer to the first device layer; and the second bridge being connected according to the established protocol to the second device layer, the second bridge being transparent to the second device layer and programed to represent the first device layer.

2. The communication system of claim 1, wherein the first and second bridges each include an establish protocol interface, the established protocol interface being programmable to be a first device layer interface when programmed to be a first interface, and a second device layer interface when programmed to be a second interface.

3. The communication system of claim 2, wherein the established protocol interface includes a programmable means for programming a plurality of modes of operation according to the established protocol.

4. The communication system of claim 1, wherein at least a single second bridge includes a means for communicating with a plurality of second device layers.

5. The communication system of claim 2, wherein the first and second bridges each include a down bridge direction and an up bridge direction and wherein each bridge in the down bridge direction includes an assembler means for converting an established protocol cell to a transport container for transmitting over the serial connection.

6. The communication system according to claim 5, wherein each bridge includes a means for detecting back pressure operatively connected to the assembler means and the assembler means includes a means for embedding the detected back pressure into the at least one control byte.

7. The communication system according to claim 5, wherein the transport container further includes an error code and each of the first and second bridges include a means for generating an error code on at least a first portion of the transport container operatively connected to the assembler means and the assembler means includes a means for assembling the error code into the transport container.

8. The communication system according to claim 5, wherein the transport container includes a header, and a payload field and the assembler means includes a means for embedding an alarm and signal code into the transport container.

9. The communication system according to claim 5, wherein each bridge includes a parity generator and checker operatively connected to the serial communication interface for generating a parity code and operatively connected to the assembler means and the assembler means includes a means for embedding the parity code into the transport container.

10. The communication system of claim 2, wherein the first and second bridges each include a down bridge direction and an up bridge direction and wherein each bridge in the up bridge direction includes a disassembler means for converting a transport container to the established protocol cell for transmitting over the established protocol interface.

11. The communication system according to claim 10, wherein the transport container includes a back pressure indication and the disassembler means includes a means for disassembling the pack pressure indication.

12. The communication system according to claim 10, wherein the transport container further includes an error code and the disassembler means includes a means for disassembling the error code.

13. The communication system according to claim 11, wherein the transport container further includes an embedded alarm and signal code and the disassembler includes a means for extracting the embedded alarm and signal code.

14. The communication system according to claim 13, wherein each bridge includes a parity generator and checker operatively connected to the serial communication interface for checking a parity code assembled the transport container.

15. In a communication system comprising a first bridge, and a second bridge serially connected to the first bridge, a method for providing a serial communication interface between a first device layer such as an asynchronous transfer mode (ATM) layer and a second device layer such as a physical (PHY) layer including the steps of;

connecting the first bridge being according to an established protocol to the first device layer;

programing the first bridge to represent the second device layer to the first device layer and to be transparent to the first device layer;

connecting the second bridge according to the established protocol to the second device layer; and

programming the second bridge to represent the first device layer and to be transparent to the second device layer.

16. The method according to claim 15, wherein the first and second bridges each comprises an established protocol interface and the step of programing the first bridge includes the step of enabling the established protocol interface of the first bridge to communicate with the first device layer and the step of programing the second bridge includes the step of enabling the established protocol interface of the second bridge to communicate with the second device layer.

17. The method of claim15, further comprises the step of programing the established protocol interface to a first mode of operation selected from a plurality of modes of operation according to the established protocol.

18. The method according to claim 17, further includes the step of communicating with a plurality of second device layers from at least a single second bridge.

19. The method according to claim 15, wherein the first and second bridges each include a down bridge direction and an up bridge direction and wherein for each bridge in the down bridge direction the method includes the steps of:

converting an established protocol cell to a transport container; and

transmitting the transport container over the serial connection.

20. The method according to claim 19, wherein the step of transmitting the transport container over the serial connection includes the step of transmitting a fame of a predefined number of transport containers.

21. The method according to claim 20, further including the steps of: generating an error code of at least a first portion of each transport container; and assembling the error code into the transport container having the first portion on which the error code was generated.

22. The method according to claim 21, further including the step of marking a predetermined transport container of the frame by modifying the error code assembled in the predetermined transport container.

23. The method according to claim 20, further including the step of generating a parity code on the frame; and inserting the parity code into a predefined transport container.

24. The method according to claim 23, wherein each transport container includes at least one control byte and the step of inserting the parity code into the predefined transport container includes the step of modifying the control byte to reflect the parity code.

25. The method according to claim 20, further comprising the step of: arranging the plurality of transport containers into the frame of N blocks wherein N is a positive number with each block including M transport containers where M is a positive number and each transport container includes at least one control byte, the step of transmitting the transport containers includes the step of sequentially transmitting a first transport container of a first block through a last transport container of a last block.

26. The method according to claim 25, wherein each transport container includes a plurality of bytes and each byte includes a plurality of bits and the method further comprises the step of generating a bit interleave parity code over Q transport containers of a group of N/P blocks where Q is a positive number less than M and P is a positive number.

27. The method according to claim 26, wherein P is equal to 1 and the method includes a step of embedding the bit interleave parity into the at least one control byte of the of the last , transport container of the last block.

28. The method according to claim 26, wherein P is greater than 1, and N/P equal to P equal sections of blocks and the method includes a step of embedding the generated bit interleave parity into the at least one control byte of the of a last transport container of a first section of blocks.

29. The method according to claim 25, further includes the step of embedding communication information into at least one control byte in a predefined transport container of each block.

30. The method according to claim 29, wherein the step of assembling communication information into at least one control byte in a predefined transport container of each block includes the step of embedding alarm information into the at least one control byte.

31. The method according to claim 29, wherein the step of assembling communication information into at least one control byte in a predefined transport container of each block includes the step of embedding a parity code into the at least one control byte.

32. The method according to claim 25, further includes the step of embedding back pressure information in the at least one control byte in selected transport containers.

33. The method according to claim 32, wherein each block represents a sub-port with each sub-port being capable of connecting to a plurality of ports and each of one of a plurality of bits in the at least one control byte being used to identify a port with back pressure, the step of assembling back pressure information in the at least one control byte in selected transport containers includes the step of setting a first logic state in a bit identifying the port with back pressure.

34. The method according to claim 15, wherein the first and second bridges each include a down bridge direction and an up bridge direction and wherein each bridge in the up bridge direction includes the steps of:

receiving a transport container having a plurality of bytes with each byte comprising a plurality of bits;

converting the transport container to an established protocol cell; and

transmitting the established protocol cell over the established protocol interface.

35. The method according to claim 34, wherein the transport container includes a header, and a payload field and at least one control byte and the method includes the step of detecting back pressure to the first bridge and the second bridge from the at least one control byte.

36.The method according to claim 34, wherein the transport container includes a header, and a payload field and at least one control byte and the method include the step of performing an error check on at least a first portion of the transport container from an error code stored in the at least one control byte.

37. The method according to claim 34, wherein the step of receiving the transport container includes the step of receiving a fame having a predefined number of transport containers.

38. The method according to claim 37, wherein each transport container includes a header, an error code field and a payload field and the method include the step of checking an error code of at least a first portion of each transport container.

39. The method according to claim 37, further including the step of detecting a marking in a predefined transport container of the frame of transport containers.

40. The method according to claim 37, further including the step of checking a parity code on the frame from the parity code stored in a predefined transport container.

41. The method according to claim 40, wherein each transport container includes at least a control byte and the step of checking the parity code in the predefined transport container includes the step of detecting a parity code in the at least one control byte and checking the detected parity code for errors.

42. The method according to claim 37, wherein the frame being composed of N blocks of transport containers where N is a positive number with each block including M transport containers where M is a positive number and each transport container includes at least one control byte, the step of receiving the transport containers includes the step of sequentially receiving a first transport container of a first block through a last transport container of a last block.

43. The method according to claim 42, wherein the method further comprises the step of detecting a bit interleave parity code generated over Q transport containers of a group of N/P blocks where Q is a positive number less than M and P is a positive number; and checking the detected bit interleave parity code.

44. The method according to claim 43, wherein P is equal to 1 and the step of detecting a bit interleave parity code generated over Q transport containers of a group of N/P blocks the method further includes a step of detecting the generated bit interleave parity in the at least one control byte of the of the last transport container of the last block.

45. The method according to claim 43, wherein P is greater than 1, and where in the frame is partition into N/P equal sections of blocks and the method includes a step of detecting the bit interleave parity in the at least one control byte of the of a last transport container of a first section of blocks.

46. The method according to claim 42, further includes the step of detecting communication information in the at least one control byte in a predefined transport container of each block.

48. The method according to claim 46, includes the step of detecting a parity code in the at least one control byte in a predefined transport container of each block.

49. The method according to claim 42, further includes the step of detecting back pressure information in the at least one control byte in selected transport containers.

50. The method according to claim 49, wherein each block represents a sub-port with each sub-port being capable of connecting to a plurality of ports and each of one of a plurality of bits in the at least one control byte being used to identify a port with back pressure, the step of detecting back pressure information in the at least one control byte in selected transport containers includes the step of detecting a first logic state of a bit identifying the port with back pressure.

51. The method according to claim 42, wherein each transport container includes an error code generated over at least a first portion having a bit width equal to the number off bits in the at least first portion of each transport container and the step of receiving the frame of transport containers include the step of establishing transport container synchronization from the error code.

52. The method according to claim 51, wherein the step of establishing transport container synchronization from the error code further includes the step of continually checking for a no error indication over a bit width equal to the bit width of the al least the first portion.

53. The method according to claim 52, further includes the step of receiving a plurality of frames and wherein the error code is a CRC polynomial code and each frame includes a synch transport container and the step of receiving the plurality of frames further includes the step of establishing frame synchronization.

54. The method according to claim 53, wherein the error code in the synch transport container includes a combination of the CRC polynomial code and a coset of the CRC polynomial code and the step of establishing frame synchronization includes the step of checking the error codes in each transport container for a no error condition in the combination of the CRC polynomial code and the coset of the CRC polynomial code.